Applicant: Harry A. Leslie
Title: Method and System for Rowcount
Estimation with Multi-Column Statistics and
Histograms
Filed: December 19, 2001
Sheet 1 of 5

Processor
102

Input Device
118

Output Device
120

Memory 104

Optimizer
112

Binder
108

Parser
106

Normalizer
110

Computer
Readable
Medium Input
122

Query Data
Structure
128

Histograms
126

Computer
Readable Media
Containing
Database
124

100

**Figure 1**

Applicant: Harry A. Leslie
Title:    Method and System for Rowcount
Estimation with Multi-Column Statistics and
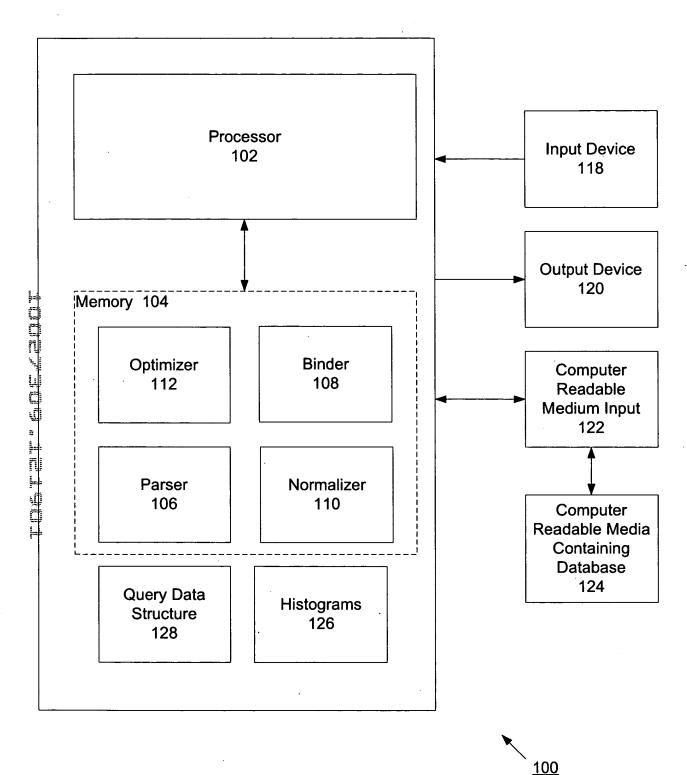Histograms
Filed: December 19, 2001
Sheet 2 of 5

```
┌─────────────────────────────────────┐
│                                     │
│     Determine Selectivity A         │
│             202                     │
│                                     │
└─────────────────────────────────────┘
                  │
                  ▼
┌─────────────────────────────────────┐
│                                     │
│      Determine Selectivity B        │
│             204                     │
│                                     │
└─────────────────────────────────────┘
                  │
                  ▼
┌─────────────────────────────────────┐
│                                     │
│  Select Min(Selectivity A, Selectivity B)  │
│             206                     │
│                                     │
└─────────────────────────────────────┘
                  │
                  ▼
┌─────────────────────────────────────┐
│                                     │
│   Estimate Multi-Column Selectivity │
│             208                     │
│                                     │
└─────────────────────────────────────┘
```

200

**Figure 2**

Applicant: Harry A. Leslie
Title:    Method and System for Rowcount
Estimation with Multi-Column Statistics and
Histograms
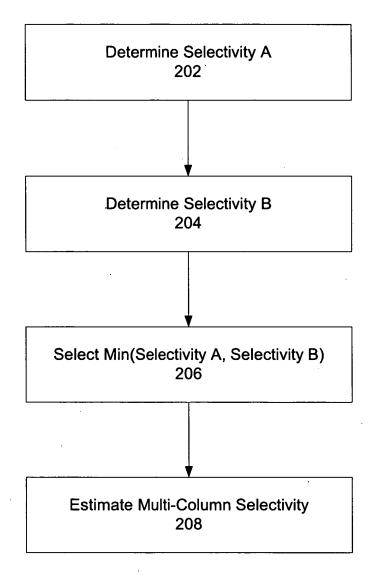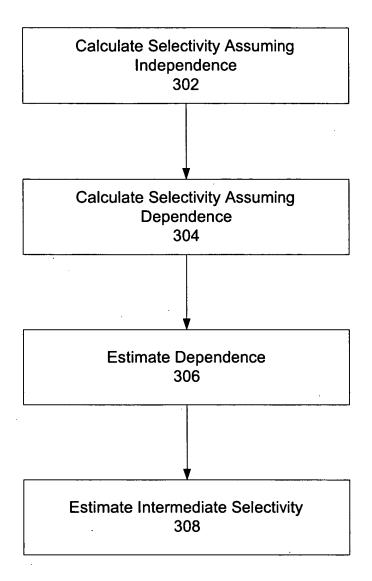Filed: December 19, 2001
Sheet 3 of 5

```
┌─────────────────────────────────┐
│  Calculate Selectivity Assuming  │
│          Independence            │
│               302                │
└─────────────────────────────────┘
                 │
                 ▼
┌─────────────────────────────────┐
│  Calculate Selectivity Assuming  │
│           Dependence             │
│               304                │
└─────────────────────────────────┘
                 │
                 ▼
┌─────────────────────────────────┐
│        Estimate Dependence       │
│               306                │
└─────────────────────────────────┘
                 │
                 ▼
┌─────────────────────────────────┐
│  Estimate Intermediate Selectivity │
│               308                │
└─────────────────────────────────┘
```

300

**Figure 3**

Applicant: Harry A. Leslie
Title:   Method and System for Rowcount
Estimation with Multi-Column Statist●●d
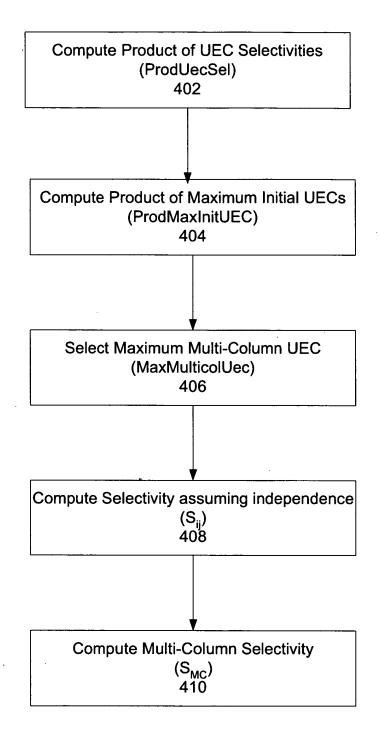Histograms
Filed: December 19, 2001
Sheet 4 of 5

```
┌──────────────────────────────────┐
│  Compute Product of UEC Selectivities  │
│            (ProdUecSel)                 │
│               402                       │
└──────────────────────────────────┘
                 │
                 ▼
┌──────────────────────────────────┐
│  Compute Product of Maximum Initial UECs │
│          (ProdMaxInitUEC)               │
│               404                       │
└──────────────────────────────────┘
                 │
                 ▼
┌──────────────────────────────────┐
│   Select Maximum Multi-Column UEC       │
│          (MaxMulticolUec)               │
│               406                       │
└──────────────────────────────────┘
                 │
                 ▼
┌──────────────────────────────────┐
│ Compute Selectivity assuming independence │
│               $(S_{ij})$                │
│               408                       │
└──────────────────────────────────┘
                 │
                 ▼
┌──────────────────────────────────┐
│   Compute Multi-Column Selectivity      │
│               $(S_{MC})$                │
│               410                       │
└──────────────────────────────────┘
```

400

**Figure 4**

| MGRNM 508 | MGRSSN 514 | DEPT 516 | ... | ... | ... | ... | ... |
|---|---|---|---|---|---|---|---|
| 510 | 516 | 518 | | | | | ← |

T1 502

532

| EMPNM 520 | EMPSSN 524 | DEPT 528 | ... | ... | ... | ... | ... |
|---|---|---|---|---|---|---|---|
| 522 | 526 | 530 | | | | | ← |

T2 504

534

| MGRNM 508 | MGRSSN 514 | DEPT 516 | EMPNM 520 | EMPSSN 524 | DEPT 528 | ... | ... |
|---|---|---|---|---|---|---|---|
| 510' | 516' | 518' | 522' | 526' | 530' | | ← |

T3 506

536

**FIGURE 5**